*Original Research Article*

OPEN ACCESS

# Medication adherence among hypertensive patients during the covid-19 pandemic: A cross-sectional study

Nurse Point: Journal of Nursing
https://primasakti.web.id/index.php/pnj/
e-ISSN: 3109-2640
Volume 2 (1), pp. 62-69, May 2026
https://doi.org/ 10.63868/npjn.v2i1.76

*Roxsana Devi Tumanggor[1], Eva Romayani[1]

[1]Faculty of Nursing, Universitas Sumatera Utara, Medan, Indonesia

**Article Info**

**Article history:**
Received: April 09, 2026
Revised: May 20, 2026
Accepted: May 21, 2026

**Keywords:**
Medication adherence; Hypertension; COVID-19 Pandemic; Primary Health Care; Cross-sectional study

**Abstract**

**Background:** Adherence is a process that patients must follow in completing treatment regimens and complying with recommendations provided by healthcare professionals and family members. Research has shown that non-adherence to hypertension treatment can hinder blood pressure control, thereby requiring interventions to improve adherence. Hypertension is a chronic condition that must be continuously managed to prevent complications that may lead to death.
**Purpose:** This study aimed to describe the level of medication adherence among hypertensive patients during the COVID-19 pandemic at the Sosopan Primary Health Center.
**Methods:** This is a quantitative exploratory study with purposive sampling technique in which samples were selected based on inclusion criteria
**Results**: A total of 93 patients met the criteria. Data were collected using the Morisky Medication Adherence Scale (MMAS-8) questionnaire. The study was conducted from February 10 to April 20, 2022. The collected data were analyzed descriptively using frequency distribution analysis. The results showed that 27 respondents (29.0%) had high adherence, 51 respondents (54.8%) had moderate adherence, and 15 respondents (16.1%) had low adherence. The primary reasons for not taking antihypertensive medication regularly during the pandemic included fear of being swabbed at the public health center (24.8%), feeling healthy (19.3%), and forgetting to take their medication (8.3%).
**Conclusion and recommendation:** These findings indicate that although some patients adhered well to their antihypertensive treatment, a substantial proportion had not yet achieved optimal adherence. Overall, the results highlight the need for targeted interventions to improve medication adherence among hypertensive patients, particularly during public health crises such as the COVID-19 pandemic.



*Corresponding Author:
**Roxsana Devi Tumanggor**
Faculty of Nursing, Universitas Sumatera Utara, Medan - Indonesia
Email: roxsana.tumanggor@usu.ac.id

## Introduction

Hypertension is a prevalent cardiovascular disorder characterized by sustained systolic blood pressure exceeding 140 mmHg and diastolic blood pressure exceeding 90 mmHg. Prolonged hypertension can result in significant damage to target organs, including the kidneys and heart, and is a leading contributor to stroke (Yonata & Pratama, 2016). As a chronic,

incurable disease, hypertension necessitates lifelong pharmacological management and strict medication adherence to maintain hemodynamic stability, reduce recurrence, and prevent fatal secondary outcomes (Burnier & Egan, 2019; Mangendai & Rompas, 2017).

The COVID-19 pandemic, which began in early 2020, caused significant disruptions in the continuum of care for chronic diseases globally. In Indonesia, primary care utilization declined sharply. Soesanto (2021) reported that patients with hypertension attended 66% fewer clinic visits. This reduction resulted from multiple barriers, including heightened anxiety about nosocomial COVID-19 transmission, strict stay-at-home orders, absence of symptoms, and insufficient family support for navigating health facilities. Consequently, patients with cardiovascular comorbidities, who faced a substantially higher risk of severe COVID-19 complications and mortality, became increasingly disconnected from essential routine care and regular medication refills (Gómez-Escalonilla Lorenzo et al., 2023).

Although research on medication adherence during the pandemic is expanding, a significant empirical gap remains. Most recent studies have focused on urban populations, where robust digital health infrastructure, telemedicine, and pharmacy delivery systems were rapidly implemented to address disruptions in clinical care (Saqlain et al., 2021). Consequently, adherence dynamics in rural and remote settings are substantially under-investigated (Kretchy et al., 2021). Rural patients face distinct structural and socioeconomic challenges, such as long distances to health clinics, demanding agricultural work schedules, lower health literacy, and financial barriers (Chow et al., 2013). Additionally, public health measures at rural clinics during the pandemic, including mandatory COVID-19 screening or swabbing, introduced new psychological barriers that may have disproportionately discouraged asymptomatic patients from seeking long-term care. Limited research exists on how acute pandemic-related fears interact with persistent rural structural constraints to influence medication adherence.

This gap needs to be urgently addressed, especially in North Sumatra, where the prevalence of hypertension among outpatients aged 60 and above was 5.52% according to the 2018 National Health Survey (Riskesdas, 2018), and hypertension accounted for 27.02% of regional mortality (Tarigan et al., 2018). Preliminary data from the Sosopan Primary Health Center, which serves 22 rural villages, indicate a concerning trend: the number of registered hypertensive outpatients aged 60 years and older increased from 948 in 2018 to 1,120 in 2019 and 1,346 in 2020, with the highest concentration in Pagaranbira Jae Village (Puskesmas Sosopan, 2020). Although the clinical burden rose in this agricultural community during the pandemic, the specific effects of rural limitations and pandemic-related anxieties on medication adherence remain unclear. Therefore, this study aims to address this gap by examining the levels of and contextual barriers to medication adherence among hypertension patients during the COVID-19 pandemic in the impoverished rural setting of the Sosopan Primary Health Center.

## Methods

### Study Design

A quantitative, descriptive, cross-sectional approach was employed to assess medication adherence among patients with hypertension during the COVID-19 pandemic. The cross-sectional design was selected for its suitability in enabling simultaneous observation and measurement of exposure and outcome variables at a single point in time. This methodology offers a clear snapshot of adherence behaviors and contextual barriers within the target population during a public health crisis (Polit & Beck, 2021; Setia, 2016).

**Setting and samples**

The study was conducted at the Sosopan Primary Health Center in Indonesia. The target population comprised 1,346 registered hypertensive patients receiving active outpatient care. Participants were recruited through a sequential sampling strategy. This non-probability approach was implemented to minimize selection bias by systematically enrolling all eligible patients during designated clinic hours (Polit & Beck, 2021). Inclusion criteria included: (1) formal diagnosis of hypertension, (2) registration as active outpatients, (3) willingness to participate, and (4) ability to communicate fluently in Indonesian. Exclusion criteria were severe acute illness or cognitive impairment that would preclude completion of the questionnaire.

Statistical validity and reliability were ensured by determining the required sample size through an a priori power analysis using G*Power version 3.1 software (Faul et al., 2007). The minimum sample size required was approximately 85 participants, based on a medium effect size (0.30), an alpha level of 0.05, and a statistical power of 0.80. Ultimately, 93 participants were recruited, providing adequate statistical power for robust descriptive analysis.

**Measurement and data collection**

Data collection utilized the Morisky Medication Adherence Scale (MMAS-8), a validated self-report instrument designed to assess medication-taking behavior and identify adherence challenges (Morisky et al., 2008). The instrument was adapted into Indonesian based on previously validated research (Huseini, 2021). The MMAS-8 comprises eight items and produces a total score ranging from 0 to 8, classified into three adherence levels: high adherence (score = 8), moderate adherence (score = 6–7), and low adherence (score < 6). Prior to full-scale data collection, the instrument's psychometric properties were evaluated, demonstrating acceptable criterion validity (coefficient = 0.576) and internal consistency (Cronbach's alpha = 0.795).

Self-administered questionnaires were distributed in the healthcare facility's waiting room. Before survey distribution, participants received a comprehensive briefing regarding the study's objectives, procedures, and the assurance of complete anonymity. Participants completed the surveys independently, with neutral, non-leading assistance provided only upon request to those with limited literacy.

**Data analysis**

Data were coded, entered, and analyzed systematically using statistical analysis software (e.g., IBM SPSS Statistics). Descriptive statistics summarized variable distributions. Frequency distributions and percentages were calculated for socio-demographic characteristics, adherence levels, and primary reasons for compliance or non-compliance during the pandemic, providing a comprehensive epidemiological profile of the sample.

**Ethics Considerations**

The study adhered to ethical guidelines for medical research involving human subjects as specified in the Declaration of Helsinki. Written informed consent was obtained from all participants prior to enrollment, emphasizing the voluntary nature of participation and assurance that clinical care would not be affected. All personal identifiers were removed from the dataset to maintain confidentiality and anonymity throughout data management and reporting. The study protocol was reviewed and approved by the Health Research Ethics Committee of Universitas Sumatera Utara (Approval Number: 188/KEPK/USU/2022).

## Results

The results of the study indicated that the majority of the research sample were female, totaling 69 participants (74.2%), aged 46-55 years, with 29 participants (31.2%), high school graduates with 62 participants (66.7%), and most were working as farmers, totaling 52 participants (55.9%). The detailed characteristics of the research sample can be seen in Table 1 below.

**Table 1.** Frequency Distribution and Percentage Based on Hypertensive Patient Characteristics During the COVID-19 Pandemic at the Sosopan Health Center (n=93)

| No | Characteristics | Frequency | Percentage |
|---|---|---|---|
| 1 | Sex | | |
| | Male | 24 | 25.8 |
| | Female | 69 | 74.2 |
| 2 | Age (years old) | | |
| | 36-45 | 20 | 21.5 |
| | 46-55 | 29 | 31.2 |
| | 56-65 | 26 | 28 |
| | >65 | 18 | 19.4 |
| 3 | Educational Background | | |
| | Elementary School | 3 | 3.2 |
| | Junior High School | 21 | 22.6 |
| | Senior High School | 62 | 66.7 |
| | Diploma | 3 | 3.2 |
| | Bachelor Degree | 4 | 4.3 |
| 4 | Occupation | | |
| | Unemployed | 20 | 21.5 |
| | Retired | 1 | 1.1 |
| | Self Employed | 11 | 11.8 |
| | Farmer | 52 | 55.9 |
| | Civil Servant | 4 | 4.3 |
| | Merchant | 5 | 5.4 |
| 5 | Income (Rp) | | |
| | <Rp 1.500.000 | 71 | 76.3 |
| | > Rp 1.500.000 | 22 | 23.7 |

Based on the level of patient adherence, the data reveal that the majority of patients fall within the moderate adherence range, accounting for 54.8%, while only 16.1% exhibit low adherence. This can be further seen in Table 2.

**Table 2.** Level of Adherence (n=93)

| Adherence Level | Frequency | Percentage |
|---|---|---|
| High | 27 | 29.0 |
| Moderate | 51 | 54.8 |
| Low | 15 | 16.1 |
| Total | 93 | 100.0 |

The results of the study indicate that patients who do not adhere to antihypertensive medication are influenced by several factors. Based on the responses to the question of the reason for taking medication regularly are as follows. 36 individuals (33.0%) reported taking the medication to recover quickly, one person (0.9%) to prevent disease recurrence, 27 individuals (24.8%) to prevent an increase in blood pressure, and 15 individuals (13.8%) to avoid the onset of new illnesses.

On the contrary, the reasons for not taking antihypertensive medication regularly during the pandemic included: 21 individuals (19.3%) who felt they were already healthy, nine individuals (8.3%) who forgot to take their medication, 27 individuals (24.8%) who were afraid of being swabbed at the public health center, four individuals (3.7%) who could not afford transportation to the health center, and four individuals (3.7%) who were tired of taking medication. This can be seen in Table 3 below.

**Table 3.** Frequency Distribution and Percentage of Medication Adherence Questions Among Hypertensive Patients During the COVID-19 Pandemic at the Sosopan Health Center (n=93)

| No | Question | Frequency | Percentage |
|---|---|---|---|
| 1. | What are the reasons that make you continue to take antihypertensive medication regularly during the COVID-19 pandemic? | | |
| | To recover quickly | 36 | 33 |
| | To prevent disease recurrence | 1 | 0.9 |
| | To prevent an increase in blood pressure | 27 | 24.8 |
| | To avoid the onset of new illnesses | 15 | 13.8 |
| 2 | What are the reasons that prevent you from taking antihypertensive medication regularly during the COVID-19 pandemic? | | |
| | Feeling healthy | 21 | 19.3 |
| | Forgot to take their medication | 9 | 8.3 |
| | Afraid of being swabbed at the public health center | 27 | 24.8 |
| | Could not afford transportation to the health center | 4 | 3.7 |
| | Tired of taking medication | 4 | 3.7 |

## Discussion

The sociodemographic characteristics of the respondents, who were mostly pre-elderly female farmers with moderate adherence to medication, indicate a complex interplay among biological, vocational, and systemic factors. The increased prevalence of hypertension in women over 50 years of age in this cohort is mainly a consequence of the hormonal changes after menopause, which is consistent with recent findings of Ayuchecaria et al. (2018) and Listiana et al. (2020). Estrogen deficiency leads to major changes in vascular endothelial function and is a major biological driver of increased blood pressure (Maranon & Reckelhoff, 2013). However, optimal therapy adherence seems to be difficult to achieve in this particular group. The moderate adherence levels observed here can be interpreted in light of the participants' main occupation as rural farmers. The agrarian lifestyle is characterized by a demanding daily physical regimen and geographical separation from major healthcare centers, which create inherent structural impediments to routine clinical check-ups and consistent prescription refills (Kretchy et al., 2021).

In addition to these pre-existing structural restrictions, adherence behaviors were severely destabilized by the COVID-19 epidemic. Interestingly, in this study, the primary intrinsic motivation for treatment compliance of these patients was to prevent the rise in blood pressure and to maintain their physical capability. This proactive health-seeking behavior is consistent with qualitative findings reported by Zahmatkeshan et al. (2021), who found that

cardiovascular patients prioritized treatment regimens during the pandemic to maintain their overall health. These findings strongly align with the Health Belief Model (Islam et al., 2025), which posits that health behavior is dictated by an individual's perception of susceptibility, severity, benefits, and barriers. In this rural population, the perceived barrier of potential COVID-19 testing and the fear of nosocomial infection appear to have outweighed the perceived benefits of routine medication collection. Low income further compounded this challenge by limiting access to alternative transportation or private, non-screening healthcare options.

However, external pandemic-specific hurdles often frustrated these fundamental drives. The worldwide crisis severely disrupted access to traditional healthcare; lockdowns, mobility restrictions, and weakened social support networks had serious impacts on therapeutic continuity (Gómez-Escalonilla Lorenzo et al., 2023; Saqlain et al., 2021). These systemic disruptions, along with the fear of nosocomial infections in health institutions, greatly hampered efficient patient-provider communication in rural settings. Patients were left isolated throughout the pandemic due to the loss of continuous and sympathetic contact, a major determinant of chronic disease adherence (Edi, 2015; Haeruddin et al., 2021). Thus, the moderate adherence observed in this study is not necessarily indicative of patient apathy but rather a pragmatic compromise by rural communities managing the simultaneous demands of chronic disease management and acute pandemic-related concerns.

**Implication and limitations**

These findings have important implications for clinical nursing practice and primary healthcare policy in rural settings. To address the particular structural and psychological constraints highlighted, healthcare providers need to move from passive forms of care to proactive outreach, integrated with the community. Health education coupled with family empowerment, telemedicine modifications for low-resource settings, and decentralized drug distribution by community health workers (kader) are crucial interventions to sustain chronic illness management in public health emergencies.

Despite these discoveries, several limitations of this study remain. First, the cross-sectional design does not allow for causal inference about the relationships between demographic characteristics, pandemic worries, and levels of adherence. Secondly, the study was conducted at a single rural primary healthcare center, which may affect the generalizability of the results to urban or national populations. Finally, the use of self-reported data using the MMAS-8 questionnaire may be prone to recall or social desirability bias. Longitudinal studies across multiple geographical settings will be needed in the future to provide a more complete picture of adherence trajectories.

**Conclusion**

The study found that medication adherence among hypertension patients at the Sosopan Primary Health Center during the COVID-19 pandemic was mostly moderate. The demographic profile showed a greater risk of the pre-elderly female farmers with low socioeconomic position. An intrinsic incentive to maintain stable blood pressure encouraged adherence, but considerable pandemic-specific barriers, most notably the dread of required nasopharyngeal swabbing at clinical facilities, severely impeded consistent therapy. In addition, bivariate studies suggested significant relationships between higher education and income levels and improved adherence outcomes. Policy frameworks must incorporate flexible, community-based drug delivery and alternative health screening techniques that do

not inadvertently discourage patients from seeking needed chronic care during future public health emergencies, safeguarding vulnerable rural communities.

**Acknowledgments**

The authors would like to thank all the patients who voluntarily participated in this study despite the challenges of the COVID-19 pandemic. We also thank the workers and management of Sosopan Primary Health Center for their logistical support during the data collection period.

**Author contribution**

Conceptualization: RDT. Methodology: ER. Formal analysis: ER. Investigation (Data Collection): RDT & ER. Writing – original draft preparation: ER. Writing – review and editing: RDT. Supervision: RDT. All authors have contributed to, read, and approved the published version.

**Conflict of interest**

The authors state that they have no known competing financial interests or personal ties that could have affected the work reported in this study.

**References**

Ayuchecaria, N., Khairah, S. N., & Feteriyani, R. (2018). Tingkat kepatuhan minum obat pasien hipertensi di Puskesmas Pekauman Banjarmasin. *Jurnal Insan Farmasi Indonesia*, *1*(2), 234–242. https://doi.org/10.36387/jifi.v1i2.254

Burnier, M., & Egan, B. M. (2019). Adherence in hypertension: A review of prevalence, risk factors, impact, and management. *Circulation Research*, *124*(7), 1124–1140. https://doi.org/10.1161/CIRCRESAHA.118.313220

Chow, C. K., Teo, K. K., Rangarajan, S., Islam, S., Gupta, R., Avezum, A., ... & Yusuf, S. (2013). Prevalence, awareness, treatment, and control of hypertension in rural and urban communities in high-, middle-, and low-income countries. *JAMA*, *310*(9), 959–968. https://doi.org/10.1001/jama.2013.184182

Edi, I. G. M. S. (2015). Faktor-faktor yang mempengaruhi kepatuhan pasien pada pengobatan: Telaah sistematik. *Jurnal Ilmiah Medicamento*, *1*(1), 1–8. https://doi.org/10.36728/jic.v1i1.134

Faul, F., Erdfelder, E., Lang, A. G., & Buchner, A. (2007). G*Power 3: A flexible statistical power analysis program for the social, behavioral, and biomedical sciences. *Behavior Research Methods*, *39*(2), 175–191. https://doi.org/10.3758/bf03193146

Gómez-Escalonilla Lorenzo, S., Martínez, I., & Notario Pacheco, B. (2023). Influence of COVID-19 on treatment adherence and psychological well-being in a sample of hypertensive patients: A cross-sectional study. *BMC Psychiatry*, *23*(1), 1–9. https://doi.org/10.1186/s12888-022-04473-2

Haeruddin, H., Ananda, U. D. D., Fachrin, S. A., & Yusuf, R. A. (2021). Faktor yang mempengaruhi kepatuhan pengobatan pasien hipertensi pada masa pandemi Covid-19. *Jurnal Ilmiah Kesehatan (JIKA)*, *3*(3), 166–176. https://doi.org/10.36590/jika.v3i3.197

Islam, M. T., Arafat, S. M., Chowdhury, A., & Orchi, K. (2025). Role of the Health Belief Model in the management of hypertension: A systematic review. *Cureus*, *17*(10), e94139. https://doi.org/10.7759/cureus.94139

Kretchy, I. A., Asiedu-Danso, M., & Mahame, F. (2021). Medication adherence and quality of life of patients with hypertension and diabetes amidst the COVID-19 pandemic in a rural setting. *PLOS ONE*, *16*(3), e0249209. https://doi.org/10.1371/journal.pone.0249209

Listiana, D., Effendi, S., & Saputra, Y. E. (2020). Factors associated with obedience of hypertension patient on doing treatment in Karang Dapo Primary Health Care Muratara District. *Jurnal Keperawatan dan Kebidanan*, *8*(1), 11–22.

Mangendai, Y., & Rompas, S. S. H. (2017). Faktor-faktor yang berhubungan dengan kepatuhan berobat pada pasien hipertensi di Puskesmas Ranotana Weru. *e-journal Keperawatan (e-Kp)*, *5*(1).

Maranon, R., & Reckelhoff, J. F. (2013). Sex and gender differences in control of blood pressure. *Clinical Science*, *125*(7), 311–318. https://doi.org/10.1042/CS20130140

Morisky, D. E., Ang, A., Krousel-Wood, M., & Ward, H. J. (2008). Predictive validity of a medication adherence measure in an outpatient setting. *The Journal of Clinical Hypertension*, *10*(5), 348–354. https://doi.org/10.1111/j.1751-7176.2008.07572.x

Polit, D. F., & Beck, C. T. (2021). *Nursing research: Generating and assessing evidence for nursing practice* (11th ed.). Wolters Kluwer.

Puskesmas Sosopan. (2020). *Profil Puskesmas Sosopan*.

Riskesdas. (2018). *Laporan nasional RISKESDAS 2018*. Badan Penelitian dan Pengembangan Kesehatan.

Saqlain, M., Atif, M., Malik, M. N., Ishtiaq, W., & Chiumento, A. (2021). Impact of COVID-19 pandemic on medication adherence among patients with hypertension and diabetes: A qualitative insight. *Frontiers in Pharmacology*, *12*, 671135. https://doi.org/10.3389/fphar.2021.671135

Setia, M. S. (2016). Methodology series module 3: Cross-sectional studies. *Indian Journal of Dermatology*, *61*(3), 261–264. https://doi.org/10.4103/0019-5154.182410

Soesanto, E. (2021). Hubungan dukungan keluarga dengan upaya perawatan kesehatan lanjut usia dimasa pandemi COVID-19. *Jurnal Keperawatan dan Kesehatan Masyarakat STIKES Cendekia Utama Kudus*, *10*(2), 170–179.

Tarigan, A. R., & Lubis, Z. S. (2018). Pengaruh pengetahuan, sikap dan dukungan keluarga terhadap diet hipertensi di Desa Hulu Kecamatan Pancur Batu Tahun 2016. *Jurnal Kesehatan*, *11*(1), 9–17. https://doi.org/10.24252/jkesehatan.v11i1.5107

Yonata, A., & Pratama, A. S. P. (2016). Hipertensi sebagai faktor pencetus terjadinya stroke. *Jurnal Majority*, *5*(3), 17–21.

Zahmatkeshan, N., Khademian, Z., Zarshenas, L., & Rakhshan, M. (2021). Experience of adherence to treatment among patients with coronary artery disease during the COVID-19 pandemic: A qualitative study. *Health Promotion Perspectives*, *11*(4), 467–475. https://doi.org/10.34172/hpp.2021.59